CLAIMS:

1. A magnetic resonance imaging apparatus comprising:

an acquiring device for acquiring echo data of a plurality of views with spins within a subject brought to an SSFP state and repeating the acquisition for $k = 0$ through $M - 1$ (M being an integer not less than two; $k = 0, 1, \ldots, M - 1$) with a step difference in a phase of an RF pulse of $2\pi \cdot k / M$;

a transforming device for conducting Fourier transformation on the echo data based on said phase;

an adding device for obtaining a sum of absolute values of F(0) term and F(1) term of the Fourier-transformed data; and

an image producing device for producing an image based on the sum data.

2. A magnetic resonance imaging apparatus comprising:

an acquiring device for acquiring echo data of a plurality of views in which a phase difference between water and fat is $2\pi/m$ ($m \geq 2$) with spins within a subject brought to an SSFP state and repeating the acquisition for $k = 0$ through $M - 1$ (M being an integer not less than two; $k = 0, 1, \ldots, M - 1$) with a step difference in a phase of an RF pulse of $2\pi \cdot k / M$;

a transforming device for conducting Fourier transformation on the echo data based on said phase;

a separating device for separating water data and fat data respectively in F(0) term and F(1) term of the Fourier-transformed data using the phase difference between water and fat;

an adding device for obtaining a sum of absolute values of at least the water data or fat data in the F(0) term and F(1) term; and

an image producing device for producing an image based on the sum data.

3. The magnetic resonance imaging apparatus of claim 2, wherein said acquiring device acquires the echo data with an echo time TE of 1/m1 (m1 ≥ 2) of a time at which the phase difference between water and fat reaches 2π, and acquires the echo data a with a difference between a pulse repetition time TR and an echo time TE of 1/m2 (m2 ≥ 2) of a time at which the phase difference between water and fat reaches 2π.

4. The magnetic resonance imaging apparatus of claim 3, wherein m1 = m2 = 4.

5. The magnetic resonance imaging apparatus of claim 3, wherein the echo time TE is equal to the pulse repetition time TR multiplied by *a* (*a* = m2 / (m1 + m2)).

6. The magnetic resonance imaging apparatus of claim 3, wherein the echo time TE is 1/2 (m1 = m2) of the pulse repetition time TR.

7. The magnetic resonance imaging apparatus of claim 2, wherein said separating device separates water data and fat data after correcting a phase error in the Fourier-transformed data due to magnetic field inhomogeneity.

8. The magnetic resonance imaging apparatus of claim 7, wherein said separating device corrects the phase error by a phase distribution multiplied by 1/m, after multiplying the phase of the Fourier-transformed data by *m* to make water and fat in phase and correcting wraparound of a portion

beyond a range of $\pm\pi$.

9. The magnetic resonance imaging apparatus of claim 2, wherein said adding device obtains a sum of absolute values of the water data in the F(0) term and F(1) term.

10. The magnetic resonance imaging apparatus of claim 2, wherein said adding device obtains a sum of absolute values of the fat data in the F(0) term and F(1) term.

11. The magnetic resonance imaging apparatus of claim 2, wherein said adding device obtains respective sums of absolute values of the water data and fat data in the F(0) term and F(1) term, and

said image producing device produces respective images based on the respective sum data.

12. The magnetic resonance imaging apparatus of claim 1, wherein $M = 4$.

13. The magnetic resonance imaging apparatus of claim 1 or claim 2, wherein

said transforming device conducts Fourier transformation from the F(0) term to F(1) term.

14. The magnetic resonance imaging apparatus of claim 1 or claim 2, further comprising:

correcting device for correcting a phase offset and a time offset between a

gradient echo and a spin echo.

15. The magnetic resonance imaging apparatus of claim 14, wherein

said correcting device corrects the phase offset and the time offset by finding them from a phase and an echo time of the gradient echo when the phase of the spin echo is reset by a crusher, and a phase and an echo time of the spin echo when the phase of the gradient echo is reset by a crusher.

16. The magnetic resonance imaging apparatus of claim 15, wherein

said correcting device corrects the phase offset by the phase of the RF pulse, and corrects the time offset by a gradient magnetic field.